

## **Innovations in Biomedical Computational Science and Technology Initiative**

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The official link for this solicitation is: <http://grants.nih.gov/grants/guide/pa-files/PAR-09-221.html>

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Department of Health and Human Services

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[PAR-09-221](#)

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### **Description:**

This announcement covers broad-based research in biomedical informatics and computational biology, and is coordinated by the NIH Biomedical Information Science and Technology Initiative (BISTI) committee. Through this and related opportunities, Institutes and Centers of the NIH offer support for: fundamental research in biomedical informatics and computational biology; development of new computational tools and technologies; and applications of computational technologies to a particular domain area(s) in biomedical research. Information on this and related funding opportunities from participating Institutes and Centers of NIH as well as a compendium of all government programs in biocomputing can be found at <http://www.bisti.nih.gov>.

Investigators may target one or multiple areas of biomedical computing that will enable progress in biomedical research. Examples of data types that could be considered include but are not limited to genomic sequences, gene expression, proteomic, pathway data, scientific and biomedical images, qualitative descriptors for health and social science, and remote sensing and geospatial images. Specific research areas solicited in informatics or computational science include but are not limited to research, development and application of:

- Tools for data acquisition, archiving, querying, retrieval, visualization, integration and

- management.
- Platform-independent translational tools for data exchange and for promoting interoperability.
- Analytical and statistical tools for interpretation of large data sets.
- New models or simulations of complex biological processes at single and multiple levels or across multiple scales (and the development of computational and/or mathematical tools for the analysis of these processes).

Particular research activities related to the formalization of data-related concepts are appropriate under this announcement. An overall goal of this announcement is to support research and development of tools and approaches for computing on data; most of these will likely be implemented in software. Best practices for such endeavors include the explicit formalization of data-related concepts that pertain directly to the software. This would include activities such as: 1) assessing data flow and use; 2) defining the terms used for data, fields, operations, etc.; 3) defining the relationships among terms and functions; 4) defining data models and schemas; and 5) other similar activities. It is important to emphasize that these activities are appropriate as they relate closely to the particular software itself, or to making the particular software interoperable with other specific software or computational resources.

Areas of biomedical research likely to be critically dependent on biocomputing advances include but are not limited to:

- Behavioral science
- Biological rhythms
- Biomedical imaging
- Cell biology
- Demographic and social science
- Developmental biology
- Drug design at the molecular and cellular levels
- Dynamic modeling of health, chronic disease, and disablement
- Environmental science
- Epidemiology
- Genetics
- Genomics
- Immunology/inflammation
- Medical genetics
- Morphology
- Neurobiology and cognitive science
- Pharmacology
- Physiology
- Population biology
- Structural biology
- Substance abuse research
- Surgery and virtual tools
- Tissue Science and Engineering

Projects must span the interface of biomedical research and biomedical computational science and technology. Applicants will be expected to demonstrate fundamental understanding and adequate expertise in both the relevant areas of computational science and technology and biomedical research. Cross-disciplinary collaborations are strongly encouraged, including those which have been initiated or fostered through other cross-cutting initiatives and now are seeking independent support.

Given the expanding needs in biomedical research for advances in a variety of areas of information science and technology, the approaches and technologies proposed under this announcement should ultimately be generalizable, scalable, extensible, and interoperable. The projects should take into account the needs of the biomedical research community whose members will be the end users of the products of the research. The projects should also address plans for the dissemination of

useful products of the research, including approaches, technologies and tools, to the relevant research and user communities. The informatics and computational research proposed should be future-oriented, fill an area of need or projected need, and seek to exceed the current state of the art.

Through separate funding opportunity announcements of similar scientific scope, participating Institutes and Centers invite applications for R01 research [PAR-09-218](#) and R21 high risk/high impact research **PAR-09-219**. A funding opportunity announcement of identical scope is also available from the Small Business Innovation Research program (SBIR) [PAR-09-220](#). Some NIH institutes and centers may have other grant mechanisms that could apply to biomedical computing projects. Applicants are encouraged to visit the BISTI web site for these and other relevant funding opportunities [http://www.bisti.nih.gov/bistic\\_funding.cfm](http://www.bisti.nih.gov/bistic_funding.cfm).